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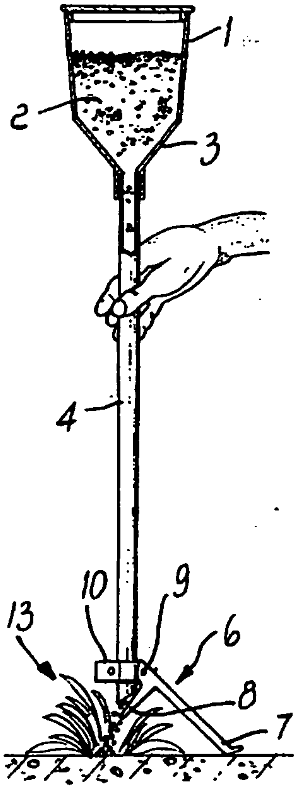
(54) Title: PORTABLE DEVICE FOR DISPENSING AND METERING GRANULAR OR POWDERY PRODUCTS

(57) Abstract

The dispensing and metering device has a container (1) connected by a funnel-shaped region (3) to a tube (4) defining a lower end (5). A valve (6) is journalled by a pivot (9) to a clamp (10) connected to the lower end (5). A biasing spring maintains the valve (6) in a normally closed position on the lower end (5). Arms (7, 8), connected to the valve (6), can be placed in contact with the ground to rotate the valve (6) about the pivot (9) against the action of the biasing spring to open the lower end (5) and dispense product (2) from the container (1) in a localized area.



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PORTABLE DEVICE FOR DISPENSING AND METERING GRANULAR OR POWDERY PRODUCTS

Technical Field

The present invention relates to a portable device for dispensing and metering granular or powdery products, particularly herbicides or fertilizers.

Background Art

The invention is used in the highly localized weeding or fertilizing operations often required in hobby and professional gardening, in agriculture and in any case in operations that entail the highly localized placement, on a flat surface such as for example a lawn or flower-bed, of small doses of dry and freely flowing granular and powdery products.

In particular, weeds, including invasive ones, very often spread in lawns and must be eliminated, otherwise they quickly spread and visibly damage the lawn.

According to a known method, these weeds are removed with blade-fitted tools, but it is obvious that this is a tiring and very slow operation.

In some cases it is possible to use selective herbicides, but since these substances are not applied in a localized manner they lead to an expensive and unhealthy application.

Disclosure of the Invention

The aim of the present invention is to provide an apparatus that can act in a localized, fast and trouble-free manner.

An object is to provide a tool for metering the product used from a minimum amount up to an amount required.

Another object is to provide an apparatus which is convenient in use and has low costs.

With the above aim and objects in view, there is provided a portable device for dispensing and metering granular or powdery products, characterized in that it comprises a container for a granular product which is associated with a discharge tube having, at its lower end, a valve which is kept closed by an elastic means and has a lever for opening it by interaction with the ground.

Brief description of the drawings

Further characteristics and advantages of the present invention will become apparent from the detailed description of a preferred embodiment thereof, given only by way of non-limitative example and illustrated in the accompanying drawings, wherein:

figure 1 is a view of the dispensing and metering device in a carrying condition;

figure 2 is a view of the dispensing and metering device of figure 1 during discharge of the product;

figure 3 is a detail view of the valve located at the base of the dispensing and metering device of figure 1;

figure 4 is a second view of the valve of figure 3;

figure 5 is an exploded view of the components of the valve;

figures 6 and 7 are views of another embodiment of the valve.

Ways of carrying out the invention

With reference to the above figures, the invention is composed of a container 1 in which the granular or powdery substance used is contained.

The lower part of said container 1 is connected, by means of a funnel-shaped region 3, to a tube 4 the lower end 5 whereof, i.e. the outlet nozzle, is obtained by cutting the tube along a plane which is inclined with respect to the ideal plane that lies at right angles to the axis of said tube.

At the lower end of said tube 4 there is a valve 6 which is substantially constituted by a body with two arms, respectively 7 and 8, which are mutually coupled, arranged substantially at right angles to each other, and associated by means of a pivot 9 with a clamping device 10 that fixes the entire assembly to said tube 4.

The valve is illustrated more clearly in figures 3, 4 and 5, where the presence of a return spring 11 is clearly shown; this spring, by acting between the clamping device 10 and the lever-like valve 6, keeps the flat face 12 of the arm 8 of the valve 6 in contact with the end part 5 of the tube 4.

As an alternative to this first shape, the lever-like valve, now designated by the reference numeral 60 in figures 6 and 7, is associated with the tube 4 by means of an elastic plate 61 which acts both as pivot, since it allows the rotation of the valve 60 relative to the tube 4, and as return spring to keep the nozzle 5 of the tube 4 closed.

The operation of the illustrated dispensing and metering device is evident and is particularly simple.

As can be clearly seen in figure 2, the tool, which is carried by hand, is rested on the ground at a weed 13 so that the arm 7 of the valve 6 interacts with the ground, spacing the arm 8 of said valve from the nozzle 5 and discharging material. The discharged material is thus positioned very accurately in a localized area.

By simply lifting the dispensing and metering device, the valve closes again and the flow of product is interrupted.

From a constructive point of view, it is particularly important that the inside of the container 1 and of the tube 4 be perfectly smooth and devoid of any discontinuity that might lead to the forming of bridges of product that would block the flow of said product when the valve is opened for discharge.

From the point of view of use, it is also important that the container and the tube be perfectly dry when the granular or powdery material is introduced.

With this device, consumption of the granular product is extremely limited and can in any case be metered according to the diffusion of the weed to be eliminated.

From this point of view, the product used is conveniently a herbicide, but it is also possible to use substances which are not specifically herbicidal but are merely caustic.

Indeed, by using chemical fertilizers one obtains the dual advantage of localized weeding by accurately controlling the exact point of discharge, whereas in the vicinity, as the caustic and water-impoverishing action of the excess fertilizer gradually decreases, one provides actual fertilization in favor of the surrounding useful plants, adequately strengthening them also with the prospect of possibly driving back the weed.

Ammonium nitrate and potassium nitrate are substances which can be used effectively and have been tested.

From what has been described and illustrated it can thus be seen that the intended aim and all the objects have been achieved, providing a dispensing and metering device for granular and powdery products which has a low cost and most of all is easy to use and economical in its operation.

The technical solutions adopted may naturally be different but nonetheless equivalent starting from the same inventive concept, and the materials may equally be any according to convenience.

CLAIMS

1. Portable device for dispensing and metering granular or powdery products, characterized in that it comprises a container for a granular product which is associated with a discharge tube that has, at its lower end, a valve which is kept closed by an elastic means and has a lever for opening it by interaction with the ground.

2. Device according to claim 1, characterized in that said container for granular product is substantially a cylindrical body that tapers like a funnel in its lower part and blends with the discharge tube.

3. Device according to claim 1, characterized in that said valve is composed of two mutually rigidly coupled arms which are arranged substantially at 90°, the first arm being flat and mating with the open end of said tube, the second arm being conveniently longer and being suitable to interfere with the ground, said lever being associated, by means of a pivot, with a means for clamping on the end of the tube.

4. Device according to claim 1, characterized in that said valve has, in its pivoting point, a spring which by acting between the clamping means and said levers keeps the nozzle, constituted by the end of the tube, normally closed.

5. Device according to claim 1, characterized in that the end of said tube is cut along a plane which is not at right angles to the geometric axis of the tube but is inclined so as to facilitate the discharge of the granular material when the valve is open.

6. Device according to claim 1, characterized in that

in an alternative solution, said lever-like valve is associated with said tube by means of an elastic lamina which acts both as return and closure spring and as a deformable element that allows to open said valve.

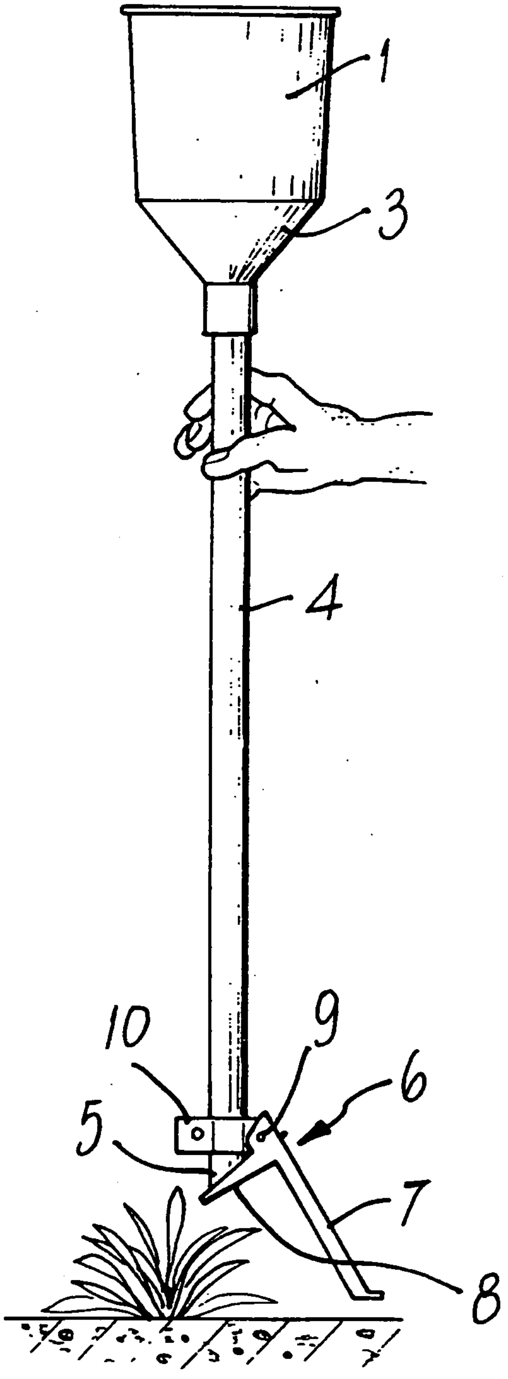

Fig.1

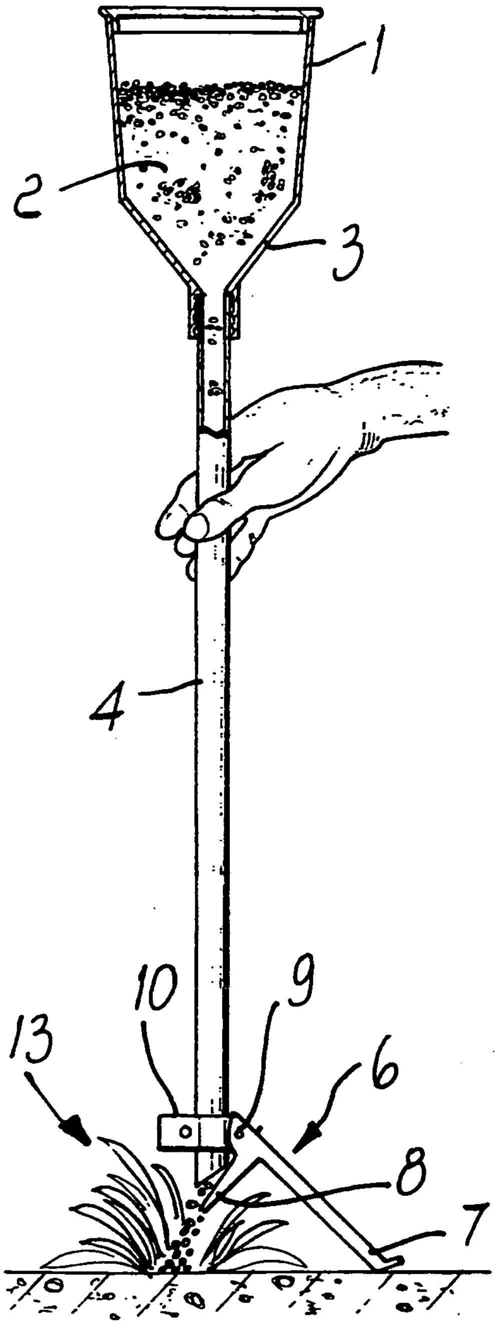

Fig.2

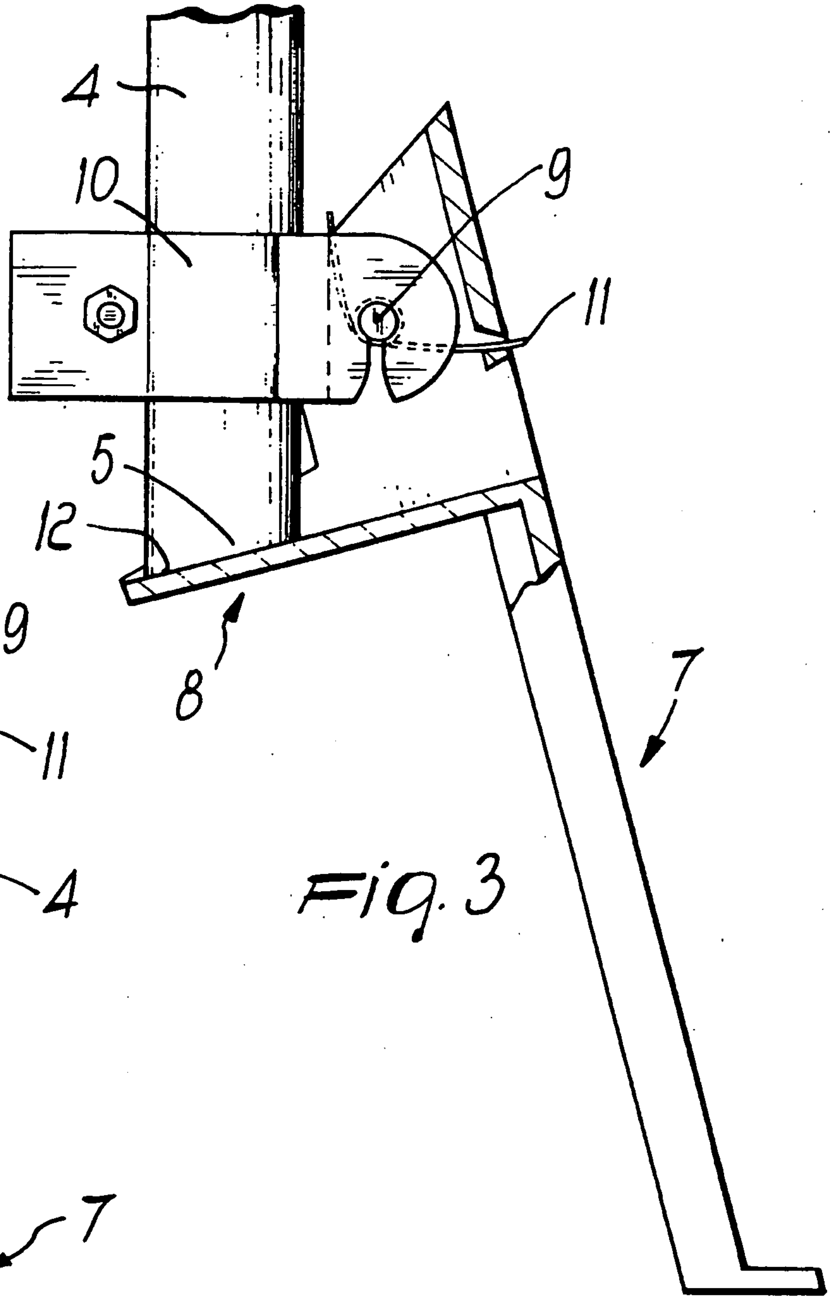

Fig. 3

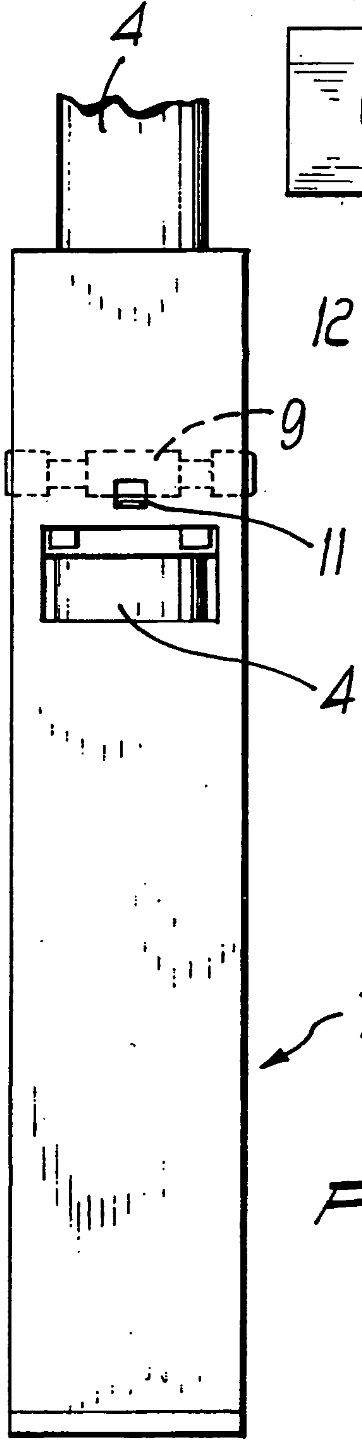

Fig. 4

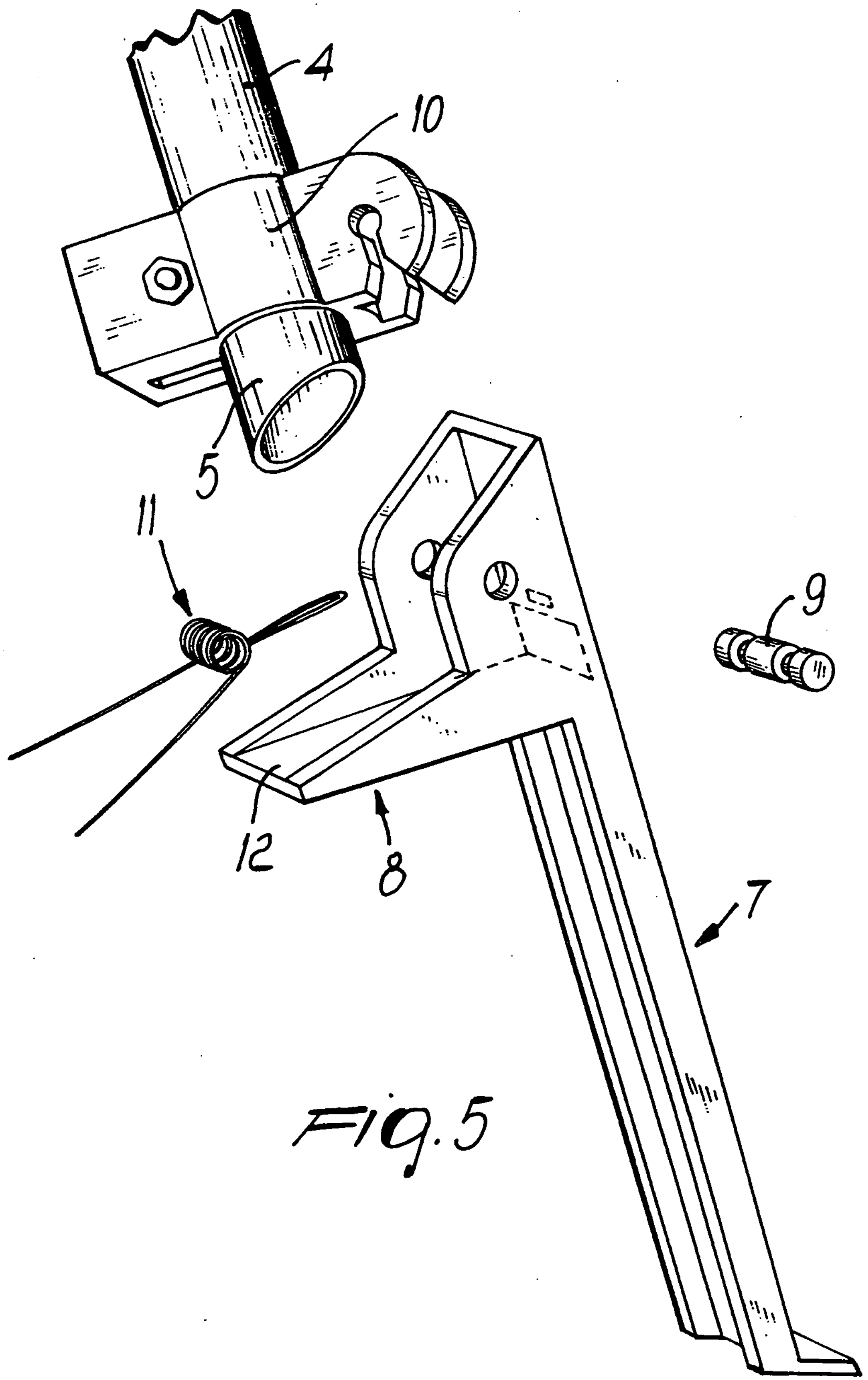

Fig.5

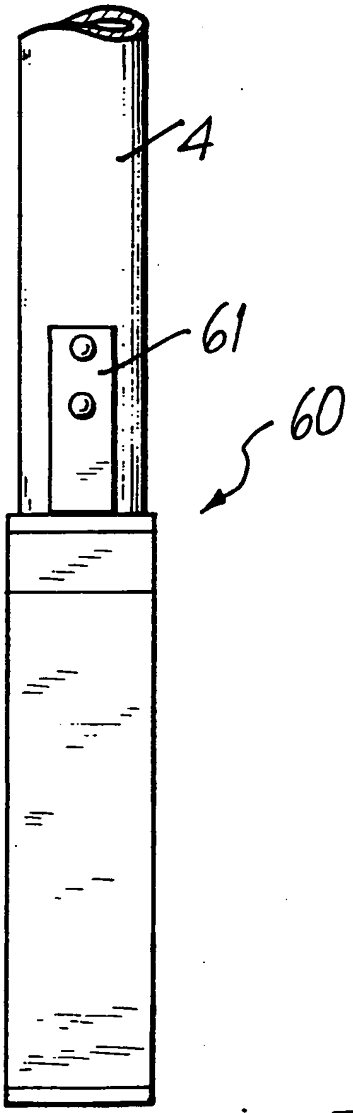

Fig.7

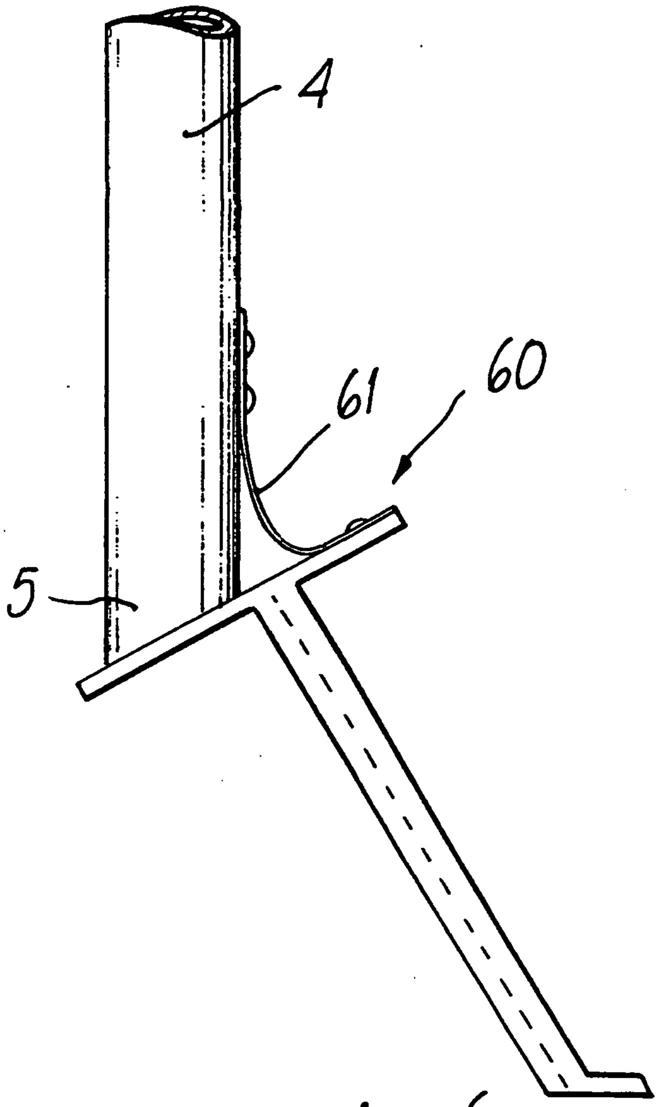

Fig.6

INTERNATIONAL SEARCH REPORT

Inter nal Application No
PCT/EP 94/00175

A. CLASSIFICATION OF SUBJECT MATTER
IPC 5 A01C7/02 A01C15/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 5 A01C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR,A,584 917 (GOUINEAU) 29 November 1924 see the whole document ---	1-5
X	FR,E,30 635 (GOUINEAU) 20 April 1926 see the whole document ---	1-5
X	US,A,2 361 005 (BAER) 24 October 1944 see page 2, line 1 - line 43; figures 1-3 ---	1,3,5
X	DE,C,822 738 (STOLCH) 29 November 1951 see the whole document ---	1-5
X	EP,A,0 489 367 (MEYER) 10 June 1992 see column 6, line 20 - column 9, line 40; figures 1-8 -----	1,5

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search 22 April 1994	Date of mailing of the international search report 30.05.94
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nformation on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
FR-A-584917		NONE	
FR-E-30635		NONE	
US-A-2361005		NONE	
DE-C-822738		NONE	
EP-A-0489367	10-06-92	DE-C- 4104685 DE-U- 9016388	09-04-92 21-03-91